copolymer being about 3,000 or less and the permeability of the mat is in the range of about 500 to about 700 CFM/sq. ft..

Remarks

Claims 62-82, 85-89 and 92-95 remain in the application. A new independent claim 96 has been added. Claims 1-61 having been cancelled, but not indicating that the invention of these claims has been abandoned or that the intent to pursue patent protection on this invention has been abandoned. Also, claims 83-84 and 90-91 have been cancelled.

Claim 62 has been amended to more particularly point out the composition and properties of the invention by limiting the mats to those having a basis weight in the range of about 2 to 2.75 pounds per 100 square feet, by limiting the glass fiber diameter to 13 +/- 2 microns and the length to 0.7 +/- 0.15 inch, the binder content to 15-25 wt. percent, the Taber stiffness to 50 or greater, the average molecular weight of the polyacrylic acid homopolymer or copolymer being about 3,000 or less and the permeability of the mat being in the range of about 500 to about 800 CFM/sq. ft. Basis for these amendments can be found on page 6, lines 15-20, page 2, lines 1-20 page 3, lines 20-26 and prior claim 63. Claims 63, 64, 68 and 71 have been amended to describe the length as about 0.75 inch, basis found on page 3, line 17. Claims 63 and 64 have been amended to state that the Taber stiffness as at least about 55, basis being found on page 2, lines 16-18 and on page 3 at line 17. Claims 66 and 70 have been amended to state that the fiber diameter is 13 +/- 1 microns with basis in original claim 71. Claims 72 – 74 and 82 have been amended to limit the mat basis wt. to about 2.3 to about 2.6, basis found in Example 4. Claims 77-81 have been amended to add a water repellant to the Markush group with basis found on page 2, line 25. Claims 93 – 95 have been amended to describe the glass in the fibers of these claims as E glass, basis found on page 3, line 18. Claim 92 has been amended to describe the mat as containing 16.5 wt. percent binder with basis found in Example 4.

A new claim 96 has been added to more particularly point out the embodiments of the invention described in Examples 3 and 4 on pages 8 and 9 of the specification.

The present invention are mats having a Taber stiffness of at least about 50, a smooth surface, an excellent and unexpected flame resistance, passing the National Fire Protection Association's (NFPA) Method #701 Flammability Test and a permeability in the range of about 500-800 CFM/sq. ft., and other requirements required for a facer for ceiling tiles of the type disclosed in the specification. As pointed out in the specification at page 2, lines 10-21, these mat properties are unique and unexpected in nonwoven mats containing a majority of glass fibers bound together with an organic binder. Such properties are very important to using non-woven mats on ceiling panels described and other specialty products. To achieve these properties the nonwoven fibrous mats contain about 65 to about 90 wt. percent glass fibers having a fiber diameter of 13 +/- 1.5 microns and a length in the range of about 0.7 +/- 0.15 inch, the fibers in the being bound together by about 15 to about 25 weight percent of a binder that is at least partially cured and comprises before drying and curing a homopolymer or a copolymer of polyacrylic acid and a polyol. Other claims describe more particularly the embodiments described in Examples 3 and 4.

Claims 62-82, 85-89 and 92-95 were rejected under 35 USC 112, second paragraph, as being indefinite because the percentage of ingredients recited in the claims does not add up to 100%. This rejection is respectfully rejected because nothing in 35 USC 112 requires that a claim contain everything in the composition. The claim contains the term comprising, leaving the claim open for the mat to contain other ingredients, and the specification and some of the dependent claims require additional ingredients in the mat. The claim is very definite with respect to being able to tell if a mat infringes the claim(s), i.e. if a mat contains what is recited, and in the amounts recited, and has the properties recited, it would infringe the claim. For these reasons applicants believe the claims satisfy the requirements of 35 USC 112, second paragraph, and respectfully request the Examiner to withdraw this rejection and allow all of the claims.

Claims 62-82, 85-89 and 92-95 were rejected under 35 USC 103 as being unpatentable over Kajander in view of Arkens et al patents '213 and '728. The Examiner stated that Kajander teaches nonwoven mats containing 25-75 wt. percent glass fibers bound together with 15-75 wt. percent of a resin binder, with the fibers having lengths in the range of 0.25 inch to about 1.25 inch and having a diameter of 1-23 microns and the major portion of the fibers having a diameter in the range of 8-16 microns, but teaching a

formaldehyde containing binder. The Examiner also stated that Arkens et al teaches a fiber glass nonwoven mat containing a type of binder of the type used in the invention and urges that it would have been obvious to have used the Arkens et al binder in the mats taught by Kajander instead of the binder taught by Kajander because both patents teach making nonwoven mats of fibers bound with a resin binder.

Example 2 of the present invention shows that the diameter and length of the fibers is critical to meeting the criteria necessary for use in a ceiling tile product described in U.S. Published Patent Application No. 20020020142 and Kajander neither teaches or reasonably suggests this new information of the combination of parameters essential to using a fibrous nonwoven mat containing a major portion of glass fibers in this application, and neither of the Arkens patents points to the fiber diameters, proportions and lengths that will produce such a mat. Therefore, it is not reasonable to suggest that one may be led to the presently claimed mats from the teachings of Kajander combined with Arkens et al '213 and '728. Even if one were to combine Example 14 of Arkens et al '728 with Kajander et al, one would not arrive at the mat according to the claimed invention. For these reasons, it seems reasonable to conclude that this combination of patents is arranged only by hindsight reconstruction after having the benefit of applicants's disclosure, an improper method of asserting obviousness.

Kajander teaches that prior art nonwoven mats did not provide the bonding strength needed for bonding to wood products, see col. 1, lines 65-67. Kajander teaches how to make nonwoven mats that do bond well to wood, and the reason that they bond good to wood is because of the formaldehyde binders used in the nonwoven mats and that the formaldehyde containing resins are only partially cured, i. e. "B" staged. Arken et al, niether '213 nor '728, teach or remotely suggest that their binders, those having a molecular weight of 3,000 or below, are useful to bond glass fibers in a mat and if only partially cured, "B" staged, would cause a nonwoven fiber glass mat or glass fibers to bond well to wood, see col. 8, lines 61-67 of '213 and Example 14 of '728. While Example 14 of Arkens et al '728 uses an Arken et al resin to bond wood chips together under high temperature and pressure, the binder used by Arkens et al, experts with this type of binder, had a molecular weight of 10,000, more than 3 times that of the binder used in the claimed invention.

Without the teachings in applicants disclosure there would be no incentive or obvious reason to modify Kajander by removing binders that Kajander taught bonded good to both glass fibers and to wood when cured to a B stage and to replace it/them with a binder taught by Arkens et al whose wood bonding qualities, in the presence of a major portion of glass fibers and in a B stage form the properties are unknown. Also, in addition to showing that some elements of applicants' invention are known, even as here, in a broad sense, the Examiner must still provide evidence of why it would be obvious for one of ordinary skill to combine the teachings together in the manner of the claimed invention to achieve applicants' claimed invention. It is not enough to merely show that both references relate to a common area of art, there must be a reasonable basis for holding it would have been obvious to one of ordinary skill to have modified the teachings of the two references to obtain the claimed invention.

There are a plethora of resins and binders that conceivably might be used to bond glass fibers together in a nonwoven mat, but it is was not obvious, when applicants set out to make a mat suitable for a facer mat for the special types of ceiling tiles as disclosed in U. S. Published Patent Application No. 20020020142, to have selected the parameters found to be important and that are recited in the present claims.

Also, Kajander does not teach or reasonably suggest using his mats as a facer for ceiling tiles of the type applicant disclosed, and neither does Arken et al suggest modifying Kajander to make such mats. This rejection, without such teachings or reasonable suggestions, is simply a hindsight reconstruction using applicants' own disclosure. Such rejections are not proper, e.g. see "improper to use Applicants' own disclosure as a roadmap to piece bits and pieces of non-related patents together with hindsight reconstruction to reject the claims under 35 USC 103, see American Medical Systems, Inc. v. Medical Engineering Corp., 26 USPQ 2d 1081, 1091, 1992, or as an instruction manual or template to piece together teachings of prior art to render the claims obvious, see In re Fritch, 23 USPQ 2d 1780, 1783, 1992. Economy of production is as valid a basis for invention as foresight in disclosure of new means and an answer to a long felt want is a valid signpost of invention, see Kaynar Company et al v. The I. Leon Co., Inc., 128 USPQ 25, 27-28, 1960.

Arkens et al teach using about 28 wt. percent of certain of their resins to bond 16 micron (M fiber) glass fibers having a length of 1.25 inches, but do not teach, or reasonably

suggest, using 15-25 wt. percent of a resin having a molecular weight of 3000 or less with 13 +/- 1.5 diameter fibers and a length of 0.7 +/- 0.15 inch to make a mat, especially a mat having properties suitable for ceiling tile of the type disclosed in published U.S. Patent Application No. 20020020142 filed April 23,2001. Further, neither Arkens et al references teache that the nonwoven mats of the present claims would have excellent and unexpected flame resistance,, nor do either Arkens et al patent reasonably suggest that their mats would pass the National Fire Protection Association's (NFPA) Method #701 Flammability Test. Arkens et al teach that their mats are heat resistant, but are silent regarding the flame resistantance of their mats. Note that in col. 1, lines 35-55, Arkens et al '213 describes that what is meant by heat resistant is a binder that can withstand 150-250 degrees C. without sagging, shrinking or otherwise becoming distorted. Heat resistant, as described by Arkens et al, obviously would not mean, to one of ordinary skill in glass fiber nonwoven mat art, that the mats are flame resistant or that they would pass the NFPA test.

The Examiner urges that if an obvious nonwoven mat composition meets all of the composition parameters of the claimed mats, a property required of the claimed mats is also an inherent property of the obvious nonwoven mat. The problem with this statement is that it is not relevant because none of the references or any reasonable combination teaches the combination that constitutes the claimed mats. None of the examples of Kajander et al mats had the combinations of mat parameters of the invention of claim 1 or any of the other claims and therefore it is unreasonable to assume that the mats taught by Kajander inherently have the properties set forth in the present claims, particularly when it is known that basis wt., fiber content, fiber diameter and type of binder substantially influence these properties.

For these reasons, applicants believe that all the claims are patentable under 35 USC 103 and respectfully request the Examiner to withdraw this rejection and to allow all of the claims.

Claims 62-82, 85-89 and 92-95 were rejected under 35 USC 103 as being unpatentable over Jaffee et al in view of Arkens et al '213. The Examiner stated that Jaffee et al teaches nonwoven mats containing 70-85 wt. percent glass fibers bound together with 15-30 wt. percent of an acrylic copolymer resin binder, but not the type of binder used in the

invention. The Examiner also stated that Arkens et al teaches a fiber glass nonwoven mat containing a type of binder of the type used in the invention and urges that it would have been obvious to have used the Arkens et al binder in the mats taught by Jaffee et al instead of the binder taught by Jaffee et al because both patents teach making nonwoven mats of fibers bound with a resin binder.

This rejection and its basis is respectfully traversed, and even more so regarding the current amended claims. Jaffee et al teach that prior art nonwoven mats did not provide the bonding strength, resistance to humidity, and low cost needed for an optimum nonwoven facer for bonding to foam, see col. 1, lines 16-53. Jaffee et al teach how to make nonwoven mats having a basis wt. of up to 1.9 lbs./100 sq. ft. that do bond well to foam, and the reason that they bond good to foam is because of most of the fibers being in bundles in the mat and the acrylic resin, having a glass transition temperature exceeding 45 degrees C., is cured to only a "B" stage. Arken et al do not teach or remotely suggest that their binders bond well to foam, that their binders have a glass transition temperature exceeding 45 degrees C, or that they that if "B" staged that they would cause a nonwoven fiber glass mat to bond well to foam, see col. 8, lines 61-67. With out such teachings there would be no incentive or obvious reason to modify Jaffee et al by removing binders that Jaffee et al taught bonded good to foam when cured to a B stage and replace it/them with a binder taught by Arkens et al whose glass transition temperature is unknown and whose foam bonding qualities or B stage properties are unknown.

There are a plethora of resins and binders that could conceivably be used to bond glass fibers together in a nonwoven mat, but it is was not obvious, when applicants set out to make a mat suitable for a facer mat for the special types of ceiling tiles disclosed in U. S. Published Patent Application No. 20020020142, to have selected the resin and the parameters found necessary in the present claims. Also, Jaffee et al does not teach or reasonably suggest using his mats as a facer for ceiling tiles of the type disclosed by applicant, and neither does Arken et al suggest modifying Jaffee et al to make such nonwoven facers. This rejection, without such teachings or reasonable suggestions, is simply an improper hindsight reconstruction using applicants' own disclosure to pick patents and put them together to meet the claimed invention instead of selecting teachings that one of ordinary skill in the art would have concluded had a sound basis for combination. Such

rejections are not proper, e.g. see "improper to use Applicants' own disclosure as a roadmap to piece bits and pieces of non-related patents together with hindsight reconstruction to reject the claims under 35 USC 103, see American Medical Systems, Inc. v. Medical Engineering Corp., 26 USPQ 2d 1081, 1091, 1992, or as an instruction manual or template to piece together teachings of prior art to render the claims obvious, see In re Fritch, 23 USPQ 2d 1780, 1783, 1992. Economy of production is as valid a basis for invention as foresight in disclosure of new means and an answer to a long felt want is a valid signpost of invention, see Kaynar Company et al v. The I. Leon Co., Inc., 128 USPQ 25, 27-28, 1960.

Also, in addition to showing that some elements of applicants' invention are known, even as here, in a broad sense, the Examiner must still provide evidence of why it would be obvious for one of ordinary skill to combine the teachings together in the manner of the claimed invention to achieve applicants' claimed invention. It is not enough to merely show that both references relate to a common area of art, there must be a reasonable basis for holding it would have been obvious to one of ordinary skill to have modified the teachings of the two references to obtain the claimed invention.

Further, neither reference teaches that the nonwoven mats disclosed in the references have excellent and unexpected flame resistance, nor does Arkens et al reasonably suggest that their mats would pass the National Fire Protection Association's (NFPA) Method #701 Flammability Test. Arkens et al teach that their mats are heat resistant, but are silent regarding the flame resistantance of their mats. Heat resistant does not mean that the mats are flame resistant or that they would pass the NFPA test #701.

The Examiner urges that if an obvious nonwoven mat composition meets all of the composition parameters of the claimed mats, a property required of the claimed mats is also an inherent property of the obvious nonwoven mat. This is not accurate because when the claim requires, in addition to the compositional ranges, that the resultant mat has certain properties, that is also a compositional requirement. The issue here is not the exact composition, but rather those compositions that have the properties that meet the requirements needed for a facer for certain types of ceiling tiles.

The Examiner urges that since both Jaffee et al and Arkens et al involve fiber glass nonwoven mats that is enough to make it obvious to combine the references. That is not a

proper basis for establishing obviousness. A Peterbuilt truck and a Mini-Cooper are both motor vehicles, but that is not enough to make it obvious to put a Peterbuilt transmission in a Mini-Cooper. There has to be a reasonable basis for why one of ordinary skill would want to combine the teachings of the references including a reasonable expectation of achieving his objective. Those critical elements of obviousness are not present with just the two references of Jaffee et al and Arkens et al.

Finally, claims 85-89, 91, 92, 94 and 95 require a hydrophilic material on at least a portion of the surface of the mat and the Examiner does not point out where this is taught or is obvious to one of ordinary skill in the art.

For these reasons, applicants believe that the claims are patentable and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 74, 82, 90 and 93 were rejected under 35 USC 103 as being unpatentable over Jaffee et al or Kajander in view of Arkens et al for the reasons given above in the rejections and further in view of Black. The Examiner urges that Black teaches compositions imparting flame retardant properties to fabrics from synthetic polymer fibers and teaches the use of cyclic organic phosphate for such purpose and that it would have been obvious to have used an organic phosphate as a flame retardant additive, motivated by the desire of providing the fibers with flame retardant properties. This rejection is respectfully traversed for the reasons given above and further because this is another example of an improper hindsight reconstruction of applicants' invention. Black does not involve a glass fiber nonwoven mat bonded with a resin binder or to a product having good bonding properties for wood or foam. Instead, Black is working with woven fabrics of cellulosic and synthetic polymer fibers and does not involve interaction with heat curable resins, see lines 53-55 of page 3, or the effects of Black's compositions on the properties of fibrous mats depending upon such resins and their heat cured bonding for properties critical for use on either wood or foam bonding strength or on the properties necessary for use on the ceiling tiles disclosed herein. For these reasons applicants believe that one of ordinary skill in the art would not look to Black in their efforts to develop a suitable facer for the ceiling tiles or find in Black the

suggestion to use an organic phosphonate with the resins taught by Arkens et al. Applicants believe that these claims are patentable under 35 USC 103 and respectfully request the Examiner to withdraw this rejection and allow all of the claims.

Applicants believe that the claims are now in condition for allowance, but if the Examiner believes one or more issues still exist, to expedite disposal of this application the Examiner is respectfully invited to call Applicants' attorney at the number listed below to discuss the issue or issues and a way of removing.

Respectfully submitted,

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